Assessment in Science

Course information

Title: Assessment in Science Education
Code: PSC 352
Credits: 3
Entry requirements:

Instructor (s) information

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Introduction

The purpose of this course is to prepare student teachers in Science to design, use tests and interpret results to improve teaching and learning in Ghanaian schools rather than for grading only. It is hoped that by the end of the course, student teachers would have gained sufficient knowledge of assessment, acquire skills in developing various forms of assessment instruments and apply them.

Subject content

- Purpose and types of assessment
- Principles and practice of continuous assessment (CA)
- Norm-referenced (NRT) and criterion-referenced (CRT) tests
- Validity and reliability of tests
- Classifying test items
- Types of testing instruments
- Guidelines in test construction
- Test item analysis and evaluation of test papers
- Description of test scores
- Assessment of process skills

Connection with other courses

Methods of teaching science; Micro-teaching (On-Campus Teaching Practice) and Students' Internship Programme (off-Campus Teaching Practice)

Learning objectives

By the end of the course, the student should be able to:

- identify and explain the various forms of assessment
- explain the characteristics of continuous assessment (CA)
- distinguish between criterion-referenced tests (CRTs) and norm-referenced tests (NRTs)
- determine validity and reliability of test instruments
- classify test items
- construct test items of various types

- describe and interpret test scores
- apply test item analysis to support formative assessment
- assess process skills

Literature and materials
Compulsory study texts:
Supplementary reading (s):
Materials used:

Type of course / learning activities

Learning activities
- Lecture and demonstrations
- Literature search with presentations
- Peer critique
- Classroom training sessions
- Group work and discussions
- Seminar presentations
- Out-of-class and in-class assignment

Course schedule
(Strategies to be adopted: questioning, written work, reflective journaling, concept maps, observations, drawings, interviews, self-evaluation and attitude surveys)

Week	Activity
1.	Purpose and types of assessment • Definitions of assessment and evaluation • Reasons for assessment • Types of assessment (formative, summative, continuous)
2.	Principles and practice of continuous assessment (CA) • Meaning and purpose of CA • Advantages and disadvantages of CA • Practice of CA in schools
3.	Norm-referenced (NRT) and criterion-referenced (CRT) tests • Characteristics and uses • Examples of NRTs and CRTs
4.	Validity and reliability of tests • Meaning of validity and reliability • Types of validity (face and content) • Determination of content validity of a test
5.	Classifying test items • Identifying instructional objectives • Bloom's taxonomy of educational objectives (cognitive domain)
6.	Types of testing instruments

- True / False Objective test items
- Matching "
- Completion "
- Multiple-choice "
- Essay tests

7. Guidelines in test construction
   - Test blue print (test specifications)
   - Suggestions for preparing multiple-choice test items (stems and options)
   - Essay tests
   - Scoring of essay test

8. Test item analysis and evaluation of test papers
   - Difficulty level
   - Discrimination index
   - Evaluating test papers

9. Description of test scores
   - Descriptive statistics (mean, median, mode and standard deviation) using ICT (calculators and Excel)
   - Correlation coefficient and regression
   - Z-score, t-score and chi-square

10. Description of test scores (contd.)

11. Assessment of process skills
   - Importance of laboratory work
   - Assessing measuring skills
   - Assessing observation skills
   - Assessing recording skills
   - Assessing interpretational skills

12. Revision

Practical sessions / field work

Rules of conduct:
Safety:
Required materials:

Assignments / Portfolio assignments

Grading policies

The grading scale is as follows: A = 80-100, B^+ = 75-79, B = 70-74, C^+ = 65-69, C = 60-64, D+ = 55-59, D = 50-54, F < 50

Course policies

Attendance:

Code of conduct**:**
Cheating / Plagiarism

Learning activities

- Literature search with presentations
- Peer critique
- Classroom training sessions
- Group discussions
- Seminar presentations
- Out-of-class and in-class assignment

Grading policies

The grading scale is as follows: A = 80-100, B^+ = 75-79, B = 70-74, C^+ = 65-69, C = 60-64, F < 60 points.

Assignment rules

Assignments are due by 4 .30p.m. as will be agreed on in class. Late work is **unacceptable**. One letter grade will be deducted for each day an assignment is late. Each homework may take between 2 and 3 hours to complete, and presentations may take longer to prepare. Please plan accordingly to devote as much time as needed to this course.

100 total course points are distributed across three required assignments, as follows:

- **40** Two individual homework assignments (20 points each)
- **60** Self-designed research proposal, final draft.

Course policies

Any violation of the university rules relating to courses will result in a failing grade on the assignment and possible university disciplinary action.

Attendance

Attendance and active participation are **required** in this class. You are expected to read all the assigned material before class and attend every class session, fully prepared to participate in discussions and activities. Lateness to lectures will not be entertained.

Code of conduct

Harassment of any nature will not be tolerated in this class. The use of mobile phones is prohibited. If you feel you are disrespected by anyone, please report the behavior to the appropriate personnel. I am committed to accommodating students with verifiable disabilities. Please let me know at the beginning of the semester if you need particular accommodations.

Plagiarism

Plagiarized work will receive a score of zero on the assignments. Plagiarism may also warrant a failing grade in the course and/or university disciplinary action.

Course policies

Attendance and participation:

- Students should be punctual at lectures.
- If a student is absent from lectures for more than three weeks, he/she should repeat the course.
- A student who will absent himself/herself from lectures should inform the lecturer in advance.
- Students should be active participants during lectures.

Code of conduct:

1. All students should show mutual respect to one another.
2. All dissenting views should be accommodated.
3. All mobile phones should be switched off during lectures.

Cheating / Plagiarism:

1. Cheating of any kind is unacceptable.
2. Acknowledge all in-text references.
3. Reproducing other people's work(s) is NOT acceptable.
4. **Plagiarism will be severely penalized.**